

Response of Ber to Nutrient Management in Relation to Yield and Physico-chemical Composition of Fruits under Semi-arid Condition

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Abstract: A field experiment was conducted on response of nitrogen, phosphorus and zinc nutrition on yield and physico-chemical composition of ber fruits under semi-arid condition of western Rajasthan. The highest fruit yield, dry matter, pulp:stone ratio, TSS, ascorbic acid, reducing sugar, non-reducing sugar, and total sugars were recorded in soil applications of 500 g each of nitrogen and phosphorus and 0.6% zinc sulphate as foliar application. The interaction among nitrogen, phosphorus and zinc was significant with respect to yield, which was maximum (42.12 kg plant⁻¹) under 500 g each of N, P and 0.6% zinc sulphate.

Key words: Ber, nitrogen, phosphorus, zinc sulphate, yield, physico-chemical quality parameters.

The ber (*Ziziphus mauritiana* Lamk.), known as the king of arid zone fruits is rich in vitamin C and sugar and fair amount of minerals. Its cultivation even on marginal and poor soils with limited irrigation water provides some income. However, for taking commercial production optimum doses of primary and secondary nutrients need to be standardized. These nutrients together with other factors, determine the yield and quality of fruits. Ber is mainly grown on marginal arid lands where there is a lack of awareness of nutrient management, which is essential to enhance yield and quality of fruits. Keeping the above scenario in view, the present investigation was undertaken to study the influence of nitrogen, phosphorus and zinc applications on the yield and physico-chemical quality parameters of ber fruits.

Materials and Methods

The investigation was carried out on 15-year-old, uniform plants of ber cv. Gola at Krishi Vigyan Kendra, Pali, under Central Arid Zone Research Institute, during 2004-05 and 2005-06. The treatments consisted of three levels each of nitrogen (250, 500 and 750 g plant⁻¹ year⁻¹), phosphorus (200, 350 and 500 g plant⁻¹ year⁻¹) and zinc sulphate (0.4, 0.6 and 0.8%) making twenty seven treatment combinations in addition to control. The experiment was laid out in factorial RBD with three replications. Fifty per cent dose of nitrogen and full dose of phosphorus were applied in basin with the onset of monsoon and remaining dose of nitrogen was applied in November after fruit set. The zinc

sulphate was applied as foliar spray thrice along with equal dose of lime for neutralization and teepol as a surfactant in the 1st week of August, September and October. The soil of the experimental site was silty loam with 135.98 kg ha⁻¹ available nitrogen, 18.22 kg ha⁻¹ phosphorus, 256.15 kg ha⁻¹ potassium, and Zinc (0.18 ppm) having pH 8.3.

The other cultural practices were applied uniformly. The fruits were harvested at color turning stage in five pickings and the yield was recorded accordingly. A sample of 500 g fruits was collected randomly from second picking from each treatment for taking observations on physico-chemical characteristics viz., moisture (%), dry matter (%), pulp content (%), pulp:stone ratio, TSS (°Brix), ascorbic acid (mg 100 g⁻¹ pulp), reducing sugar (%), non-reducing sugar (%) and total sugar (%). The fruit pulp was dehydrated at 60°C up to constant weight to record total dry matter and moisture content. Total soluble solids of the fruits were measured with the help of 'Erma' hand refractometer corrected at 20°C temperature. Ascorbic acid, reducing sugar, non-reducing sugar and total sugar contents were determined by AOAC methods (1990). The data for both the years were pooled and analyzed statistically following Gomez and Gomez (1984).

Results and Discussion

The data revealed that nitrogen, phosphorus and zinc sulphate significantly influenced the yield and physico-chemical parameters of ber fruits except non-reducing sugars (Table 1). The highest fruit yield (37.82 kg plant⁻¹), TSS (16.75°Brix),

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